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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/485,227	12/18/2001	Yasuo Kondo	501.38171X00	1668

7590

07/23/2003

Gregory E Montone
Antonelli Terry Stout & Kraus
1300 North Seventeenth Suite 1800
Arlington, VA 22209

EXAMINER

LEWIS, MONICA

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 07/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

ATA

Office Action Summary

Application No.

09/485,227

Applicant(s)

KONDO ET AL.

Examiner

Monica Lewis

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

Art Unit: 2822

DETAILED ACTION

1. This office action is in response to the amendment filed June 27, 2003.

Response to Amendment

2. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 23 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear what is meant by the following: a) "composite material has a thermal conductivity in a direction of orientation greater than twice the thermal conductivity in a direction perpendicular to the direction of orientation" (See Claim 23).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2822

6. Claims 19, 20, 23 and 25, as far as understood, are rejected under 35 U.S.C. 103(a) as obvious over Scorey (U.S. Patent No. 5,292,478).

In regards to claim 19, Scorey discloses the following:

a) a composite material comprised of copper (Cu) and cuprous oxide (Cu_2O), characterized in that said composite material contains said cuprous oxide in an amount of 20-80 vol% (For Example: See Abstract, Column 4 Line 68 and Column 6 Lines 61-63).

In regards to claim 19, Scorey fails to disclose the following:

a) composite material is sintered.

However, the limitation of "composite material is sintered" makes it a product by process claim. The MPEP § 2113, states, "Even though product -by[-] process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985)(citations omitted).

A "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao and Sato et al.*, 190 USPQ 15 at 17 (CCPA 1976) (footnote 3). See also *In re Brown and Saffer*, 173 USPQ 685 (CCPA 1972); *In re Luck and Gainer*, 177 USPQ 523 (CCPA 1973); *In re Fessmann*, 180 USPQ 324 (CCPA 1974); and *In re Marosi et al.*, 218 USPQ 289 (CAFC 1983) final product per se which must be determined in a "product by, all of" claim, and not the patentability of the process, and that an old or obvious product, whether claimed in "product by process" claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

Art Unit: 2822

Finally, the applicant has not established the critical nature of cuprous oxide in an amount of 20-80 vol%. “The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.” *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir.1990).

In regards to claim 20, Scorey discloses the following:

a) composite material has a coefficient of thermal expansion of 5×10^{-6} to $14 \times 10^{-6}/\text{C}$ (For Example: See Column 4 Lines 57 and 58).

Additionally, the applicant has not established the critical nature of a coefficient of thermal expansion of 5×10^{-6} to $14 \times 10^{-6}/\text{C}$. “The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.” *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir.1990).

In regards to claim 23, Scorey discloses the following:

a) composite material has a thermal conductivity in a direction of orientation greater than twice the thermal conductivity that in a direction perpendicular to the direction of orientation (For Example: See Figures 1-3).

In regards to claim 25, Scorey discloses the following:

a) material includes at least one of Au, Ag, Cu and Al, wherein said inorganic particles includes at least one of copper oxide, tin oxide, lead oxide and nickel oxide, wherein said composite material is sintered (For Example: See Abstract, Column 4 Line 68 and Column 6 Lines 61-63); and

b) inorganic particles are dispersed in said composite material (For Example: See Abstract).

Art Unit: 2822

In regards to claim 25, Scorey fails to disclose the following:

a) subjected to plastic working.

Although Scorey fails to specifically disclose the limitations listed above, the same material is utilized in Scorey as in Applicant's invention therefore it would have the same characteristics. Applicant states that "soft inorganic particles provide good plastic workability" (For Example: See Specification Page 11 Line 26 and Page 12 Lines 1-9).

b) sintered composite material.

However, the limitation of "sintered composite material" makes it a product by process claim. The MPEP § 2113, states, "Even though product -by[-] process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985)(citations omitted).

A "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao and Sato et al.*, 190 USPQ 15 at 17 (CCPA 1976) (footnote 3). See also *In re Brown and Saffer*, 173 USPQ 685 (CCPA 1972); *In re Luck and Gainer*, 177 USPQ 523 (CCPA 1973); *In re Fessmann*, 180 USPQ 324 (CCPA 1974); and *In re Marosi et al.*, 218 USPQ 289 (CAFC 1983) final product per se which must be determined in a "product by, all of" claim, and not the patentability of the process, and that an old or obvious product, whether claimed in "product by process" claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

Art Unit: 2822

7. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as obvious over Scorey (U.S. Patent No. 5,292,478) in view of Ishikawa et al. (U.S. Patent No. 6,110,577).

In regards to claim 21, Scorey discloses the following:

a) composite material has a thermal conductivity of 30-325 W/mK (For Example: See Table 1 and Table 2).

Additionally, the applicant has not established the critical nature of a coefficient of thermal conductivity of 30-325 W/mK. "The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir.1990).

In regards to claim 21, Scorey fails to disclose the following:

a) a range of room temperature to 300°C.

However, Ishikawa et al. ("Ishikawa") discloses a thermal conductivity of 180 W/mk in a range of room temperature to 200 °C (For Example: See Column 24 Lines 17-22). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Scorey to include a thermal conductivity of 180 W/mk in a range of room temperature to 200 °C as disclosed in Ishikawa because it aids in providing a composite material that makes it possible to obtain characteristics adapted to balance the coefficient of thermal expansion and the coefficient of thermal conductivity demanded for electronic parts (For Example: See Column 2 Lines 46-53).

Additionally, the applicant has not established the critical nature of a thermal conductivity of 30-325 W/mK in a range of room temperature to 300 °C. "The law is replete

Art Unit: 2822

with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.” *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir.1990).

Finally, since Scorey and Ishikawa are both from the same field of endeavor, the purpose disclosed by Ishikawa would have been recognized in the pertinent art of Scorey.

In regards to claim 22, Scorey discloses the following:

a) composite material has a coefficient of thermal expansion of 5×10^{-6} to $14 \times 10^{-6}/^{\circ}\text{C}$ (For Example: See Column 4 Lines 57 and 58); and

b) composite material has a thermal conductivity of 30-325 W/mK (For Example: See Table 1 and Table 2).

In regards to claim 22, Scorey fails to disclose the following:

a) a range of room temperature to 300°C .

However, Ishikawa discloses a thermal conductivity of 180 W/mk in a range of room temperature to 200°C (For Example: See Column 24 Lines 17-22). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Scorey to include a thermal conductivity of 180 W/mk in a range of room temperature to 200°C as disclosed in Ishikawa because it aids in providing a composite material that makes it possible to obtain characteristics adapted to balance the coefficient of thermal expansion and the coefficient of thermal conductivity demanded for electronic parts (For Example: See Column 2 Lines 46-53).

Art Unit: 2822

Additionally, the applicant has not established the critical nature of a coefficient of thermal expansion of 5×10^{-6} to $14 \times 10^{-6}/\text{C}$ and a thermal conductivity of 30-325 W/mK in a range of room temperature to 300 °C. “The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.” *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir.1990).

Finally, since Scorey and Ishikawa are both from the same field of endeavor, the purpose disclosed by Ishikawa would have been recognized in the pertinent art of Scorey.

8. Claim 24 is rejected under 35 U.S.C. 103(a) as obvious over Scorey (U.S. Patent No. 5,292,478) in view of Lanzi et al. (U.S. Patent No. 4,270,266).

In regards to claim 24, Scorey discloses the following:

a) a composite material comprised of copper (Cu) and cuprous oxide (Cu_2O) (For Example: See Abstract, Column 4 Line 68 and Column 6 Lines 61-63).

In regards to claim 24, Scorey fails to disclose the following:

a) composite material contains said cuprous oxide in an amount of 40-80 vol%.

However, Lanzi et al. (“Lanzi”) discloses composite material that contains cuprous oxide in an amount of 40-80 vol% (For Example: See Column 5 Table I). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Scorey to include composite material that contains cuprous oxide in an amount of 40-80 vol% as disclosed in Lanzi because it aids in providing an electrode that has good resistance to erosion (For Example: See Abstract).

Art Unit: 2822

Additionally, the applicant has not established the critical nature cuprous oxide in an amount of 40-80 vol%. "The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir.1990).

b) composite material is sintered.

However, the limitation of "composite material is sintered" makes it a product by process claim. The MPEP § 2113, states, "Even though product -by[-] process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985)(citations omitted).

A "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao and Sato et al.*, 190 USPQ 15 at 17 (CCPA 1976) (footnote 3). See also *In re Brown and Saffer*, 173 USPQ 685 (CCPA 1972); *In re Luck and Gainer*, 177 USPQ 523 (CCPA 1973); *In re Fessmann*, 180 USPQ 324 (CCPA 1974); and *In re Marosi et al.*, 218 USPQ 289 (CAFC 1983) final product per se which must be determined in a "product by, all of" claim, and not the patentability of the process, and that an old or obvious product, whether claimed in "product by process" claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

Art Unit: 2822

Finally, since Scorey and Lanzi are both from the same field of endeavor, the purpose disclosed by Lanzi would have been recognized in the pertinent art of Scorey.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 703-305-3743.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ML
July 18, 2003


AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800